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Spectral characteristics of acoustic emission in porous media

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Abstract

Acoustic emission occurs when solid media are subjected to mechanical load and deformation. The porous medium also experiences strain when creating a pressure gradient fluid. The experimentally found that the generation of noise filtration is different from the nature of the acoustic emission caused by purely mechanical loading. The amplitude of the noise filtering is dependent on the flow rate, and the frequency determined by the properties of the porous medium (porosity, permeability, fractional composition, etc.), that is independent of the fluid flow regime. Analysis of the spectra of noise filtration for all the studied artificial samples showed a pattern of increasing the frequency of the major peaks in the spectrum with increasing permeability of the porous medium. The results obtained and identified patterns can be used in solving the problems of identification of Applied Geophysics, and the implementation of wave methods of enhanced oil recovery.

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